LITTLE BLUE BOOK NO. 903
Edited by E. Haldeman-Julius

Syphilis: A Brief Treatise for the Intelligent Public

Wm. Allen Pusey, A.M., M.D., LL.D.

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PREFACE

In the following pages I have undertaken to give the essential facts of syphilis. I have not tried to write down to what is called the common intelligence, because in my opinion that is a condescension quite unnecessary with people who read, but I have tried to bear in mind that the reader of this monograph would be interested in the broad facts and the essential details of this disease rather than in its technical considerations. I have no inclination to offer any apology for an attempt to give a knowledge of syphilis to the general reader. Syphilis is one of the important diseases of civilization. Information concerning it is not only a matter of intelligent interest, but widespread knowledge of the actual facts of the disease is one of the prerequisites to a satisfactory handling of one of the most important sanitary problems we have to face. Syphilis, unfortunately, is the object of widespread exaggeration and misinformation. On the one hand, among the unintelligent and careless, its importance is minimized; on the other hand, in other quarters, there is constant exaggeration and mis-statement concerning the disease. The purpose that I have had in mind in writing this is to give a plain statement of facts. Fortunately we know most of the facts about syphilis and definite statements can be made.

SYPHILIS:

A BRIEF TREATISE FOR THE INTELLIGENT PUBLIC

CHAPTER I

GENERAL CONSIDERATIONS

Syphilis is one of the most important of diseases. It is universally distributed among all known people. It is probably the most prevalent of the serious diseases due to infection. It is distinctly a disease of man, and its occurrence naturally has not been demonstrated hitherto in any animal. It has at the same time the tragic human interest of being hereditary as no other important disease is. Its serious importance is due to the fact that it is a very indolent chronic disease which may in its course attack any structure of the body. The late symptoms it produces are the symptoms largely of the structure involved and its manifestations therefore are of the greatest variety. Its management from the sanitary standpoint is one of the most complicated problems in medicine, for it is essentially involved in that great unsolved problem of civilization, the problem of the relation of the sexes. Considering all of its aspects, it is not only one of the most important, but probably the most interesting of diseases.

If syphilis did not have its great practical importance it would still be, from the standpoint of medicine, the most interesting study that disease presents.

History of Syphilis

Syphilis has another interesting quality in its history. Most other diseases have gradually emerged into our knowledge of medicine and as we become more and more familiar with their manifestations have finally become established as definite diseases. We can recognize, for example, the old accounts of a disease that we now know as typhoid fever, although typhoid fever as a definite disease was included with typhus fever and was only separated from it in the early part of the last century. The history of syphilis, however, practically begins with a definite date. It suddenly appeared in history a very few years after the discovery of America by Columbus, and, within a few years, it swept as a great plague over the world.

Spread Over the World

The fact is not universally accepted that syphilis is of American origin. In my opinion there are the strongest reasons for believing that this is true.

As has been said, the great epidemic of syphilis spread over the world just after Columbus discovered America. It first attracted attention in Naples in 1494 and 1495 where there were mercenary troops, including many Spaniards; thence it spread over Europe. Its appearance in different countries of Europe can be accurately dated. Following its spread in

Europe it spread to the rest of the world with the contact of various countries with European sailors. In a short time it had gone over the known world; to India, China, Japan, parts of Africa, after the visits to these countries of Portuguese and other discoverers. Since its spread at the end of the Fifteenth and the beginning of the Sixteenth century it has everywhere been endemic.

Severity of New Diseases and Early Syphilis

It is a characteristic of an infectious disease that, when it occurs among a people who have never had this infection before, it runs an extraordinarily severe course. Thus measles, when it was first introduced into the Sandwich Islands and other islands of the Pacific, among a people who had never been subject to it before, caused a mortality that was literally frightful. The reason for this is, almost certainly, that after an infectious disease has existed among a people for several generations the immunity which is acquired by the individual from an attack of the particular disease is to a certain degree inherited. Inherited immunity is not sufficient to prevent infection, but it is sufficient to reduce the malignancy of the disease very considerably. We see this characteristic of the syphilis in the post-Columbian epidemic. This epidemic as it spread over Europe was of a virulence not known in syphilis since. The disease was so severe that it compelled an attention and received a record in the literature of medicine that no other disease has

received since. It was accepted at that time as a new disease and its virulence then is an item of importance in proof of this fact.

No Description of Syphilis in Ancient Literature

There is, further, according to good authority, no description of syphilis is classical literature. There are three diseases that are classed as venereal. These are: syphilis, gonorrhea and chancroid. While no infectious disease can be said to be absolutely local, nevertheless, gonorrhea and chancroid in their commonly recognized manifestations are local diseases and are, in fact, usually local diseases. Syphilis, on the contrary is characteristically a systemic disease. Local venereal diseases have been recognized from very ancient times. It is, however, a very striking fact that in medieval and ancient literature there is no genital disease with systemic manifestations which can be recognized. This in spite of the fact that sexual matters are a favorite and frequent topic in all sorts of ancient literature.

Syphilis is a disease which very frequently manifests itself in bone changes, changes that are permanent and characteristic and that can be recognized in the oldest affected bones. There are innumerable collections of ancient European, African and Asiatic bones in which syphilitic bones should be found if syphilis existed. The collection of human skeletons of pre-Columbian times have been carefully examined for syphilis and yet, according to Virchow, one of the world's greatest anthropologists and

probably its greatest pathologist, no pre-Columbian European bone has been produced showing evidence of syphilis.

There also exists in Spain documentary evidence, which seems to be above suspicion, that definitely traces the appearance of syphilis to members of Columbus's crew, in whom the disease was described by a surgeon of Lisbon, upon the return of these voyagers from Columbus's first voyage.

All of the facts very strongly suggest that syphilis is a disease that originated among the Indians of America.

There has, within the last year or two, appeared some biological evidence which may throw light upon the very origin of human syphilis. It has been shown by some South American investigators that there is a disease in the llamas, which is the beast of burden in the Andes, that is indistinguishable bacteriologically and otherwise from syphilis; and that syphilis is transmissible to llamas. The next step, therefore, in the history of syphilis may be the demonstration of the fact that it not only originated in America but that it can be traced back beyond its human host to an animal found only in America.

It is interesting to speculate upon the ultimate origin of these infectious diseases; and this possible origin of syphilis in llamas is a good illustration of how such disease may develop in man. It is probably true that most infectious bacteria were not originally infectious; they become infectious only when they acquire the ability to engraft themselves upon the hu-

man tissues and grow in these tissues! that is, they develop a capacity to take their nutriment from living human cells as an ordinary weed is able to take its from the ground. In doing this, that is, in extracting the necessary materials for its nutriment from the living cells, it destroys the involved cells and this sets up the destructive process that we know as infection.

Bacteriology of Syphilis

Syphilis is due to a little corkscrew-shaped vegetable organism of a sort that is excessively abundant in nature. Only a very few varieties, however, are known to be pathogenic for man; that is, are capable of engrafting themselves upon the human tissues and living upon them. The organism of syphilis—the spirochaeta pallida—is one of these. Probably the spirochete of syphilis originally was able to live only upon dead vegetable and animal matter. Some strain of these spirochetes of more vigorous characteristics happened under favorable conditions to gain the power to live upon living human tissue and as they propagated by the millions quickly a new species was produced which became pathogenic. That is almost certainly the origin of all of the infectious diseases. It may be that syphilis originated in a species of spirochetes that acquired infectiousness in llamas and thence spread to man. But this is all speculative as far as the history of syphilis is concerned.

Development of Knowledge of Syphilis

The study of syphilis and its record in literature began with this post-Columbian epidemic.

Indeed it may almost be said that modern medicine began with the study of the epidemic of syphilis at the beginning of the Sixteenth century. Medicine at that time had not emerged from the darkness of the middle ages. It had not acquired the habit of studying the manifestations of diseases, but was dominated by superstitions and the doctrines of Galen. It was in this respect, like all other intellectual culture, governed by dogmatism. But the appearance of this epidemic of syphilis compelled a different mental attitude. Here was a new disease of which Galen said nothing, a disease of vast importance on which physicians had no data in classical literature for philosophizing. Observation was, therefore, forced upon them.

This study of syphilis, which began in the Sixteenth century gave us gradually complete knowledge of all the manifestations of the disease. Its occurrence in the various tissues and organs of the body was described; the fact that it might be hereditary; its distinction from the other venereal diseases. Hardly any of the clinical facts of syphilis escaped record in the Sixteenth and Seventeenth centuries. Towards the end of the Eighteenth century it became confused with the other venereal diseases through some unfortunate beliefs of John Hunter, one of the very great physicians of that time, and it took nearly fifty years to clear up these mistakes. By the middle of the Nineteenth century, however, these confusions had all disappeared and the final stage of the study of the clinical course of syphilis was entered By the beginning of the Twentieth century, it

may be said that practically everything about the course and manifestations of syphilis had been worked out. Its clinical history was completely known. Its management had also been brought to a high state of effectiveness. There were, however, some important gaps before we could claim to have full knowledge of syphilis. Most important of these were that its cause was not known and, of the greatest practical importance, the treatment which we had against it, while very effective, could not be called absolutely a cure.

Twentieth Century Discoveries in Syphilis

In the first eleven years of the Twentieth century our knowledge of syphilis was increased in an amazing way. Beginning with 1903 one discovery followed another with a rapidity that was without parallel in the history of any other disease. In 1903 it was demonstrated that the disease was inoculable in apes. In 1905 the organism of syphilis was discovered. In 1906-7 the test for diagnosing infectious diseases from a reaction of blood serum was applied to syphilis and has popularly become known as the Wassermann reaction. In 1909-10 arsphenamin was worked out as a specific remedy for syphilis that opened up a new field of treatment for it. In 1911 the cycle of proof that the spirochaeta pallida caused syphilis was successfully completed by the growth of the organism in artificial media—in cultures—and the reproduction of the disease in animals by infection from these cultures. Thus, within eight years, the whole remaining history of syphilis was

worked out. We already knew all that could be known of the manifestations of syphilis. These discoveries gave us about as complete knowledge of syphilis as we can, in the present state of knowledge, have of any disease.

The discovery upon which all the others depended was that of Metchnikoff and Roux, in 1903, that syphilis could be inoculated in apes. Since that time it has been shown that syphilis can be produced in many animals, as for example rabbits. Before that any experimental work in syphilis was impossible. We are not warranted in producing experimental diseases in man and if one cannot produce a disease experimentally in animals it is impossible to study it under the carefully regulated, controlled conditions that are necessary for working out many of its problems. All of these discoveries in syphilis, except the discovery of the organism itself, were dependent upon the study of the disease in laboratory animals and even the conclusive proof that the spirochaeta pallida was the cause of syphilis was only possible by reproducing it in animals, as Noguchi did.

Fortunately animals are resistant to syphilis; they spontaneously recover from it and there is, accordingly, no danger of its spread among animals.

These fundamental discoveries of syphilis in the Twentieth century write almost the entire story of syphilis. We still have problems to work out in it, notably the one great problem of its cure, but its story is very nearly complete.

CHAPTER II

COURSE OF SYPHILIS

Syphilis is a serious disease, paradoxical as it may seem, because its course is so indolent. It is in this respect like tuberculosis and leprosy, two other of the great scourges of mankind. The reason for the danger from this indolence is this: Man and animals, when attacked by infections, overcome them by developing a resistance to the infection—which we call immunity—and this resistance is able in turn, when infectious diseases are overcome, to destroy the infection. A familiar illustration of this process is in the infections on the surface such as a boil. The inflammation around the boil is the protective process which is excited in the tissues by the infection and which destroys it. If it were not for the development of this resistance, no infection could ever be gotten rid of spontaneously. Once infected one would always be infected. In acute infectious disease, such as measles, scarlet fever and smallpox, for example, the reaction produced is sharp and intense, as witness the acute illness that characterizes these diseases. This sharp reaction produces correspondingly vigorous defense, with a result that the infection, although in these cases it is a universal systemic infection, is quickly killed off and, unless the patient is himself killed by his own reaction, he quickly recovers. In the case of syphilis, and it is

equally so in tuberculosis, and many other less important indolent diseases, the insult to the tissues produced by the infection is slight. The early reactions are trivial, painless and indolent. And, by the same token, the protective process we call resistance that is excited is very slight. In many cases of syphilis it develops to a sufficient degree to cause a spontaneous disappearance of the disease in time, but in many others it never produces this happy result. There is never any sharp reaction to the disease, never any acute illness, almost never any serious immediate danger. On the other hand, there is not a sufficient reaction produced to destroy the infection and so it may go on insidiously but without end. It is this indolence and persistence which makes syphilis a serious disease.

While syphilis is, at the start, localized at one point the organisms in a few weeks multiply rapidly and the infection becomes general. The organisms get into the blood and lymph streams and infect the entire body. When this is done a considerable natural resistance to syphilis develops and this resistance is able to destroy most of the organisms. It does at times, there seems every reason to believe, destroy all of them, so that the infection spontaneously cures itself. As a rule, however, this does not occur. The general infection is wiped out but what remains is the localized infection in isolated places.

When one knows these few facts about the pathology of syphilis, the course of the disease is readily understood. Acquired syphilis always begins as infection at a point. This point is

nearly always on the skin or the mucous membranes (the membranes that line the openings of the body). The spirochaeta pallida of syphilis cannot penetrate unbroken skin or unbroken mucous membrane and for infection to occur there must be an abrasion or a break in the surface. These breaks, however, may be of microscopic size.

The First Lesion of Syphilis—the Chancre

The indolence of syphilitic infection is shown by the slowness with which manifestations develop after infection. An infection of the skin with pus organisms produces a violent inflammatory reaction in 36 to 48 hours after infection. In contrast with this, after infection with the organism of syphilis, there is no manifestation of anything wrong for two or three weeks. It takes a good many days for the organisms to become established and grow with any activity in the tissues. Only after ten days to three weeks after infection, usually after 18 to 26 days, does a very innocent inflammatory spot occur, whose surface in the course of a few days, as a rule, becomes raw with perhaps the formation of a small ulcer. This is the chancre. Typically it is a small roundish lump, the diameter of a hazel nut kernel or a large pea. Sometimes the surface is simply raw, but sometimes there is superficial ulceration. One of the most striking characteristics is its denseness. It feels like a disk or small button-like mass in the skin. It is practically painless. This is the typical picture of a chancre and its usual form. Our experience, however, since the

discovery of the spirochaeta pallida, has shown that about the only unvarying characteristic of the chancre is its indolence and that any indolent excoriation or superficial small ulcer on the surface, particularly if it is about the orifices of the body, is suspicious of syphilis and should be examined to exclude it.

This recognition of the chancre in its early stage is one of the most important facts in the management of syphilis, for, as will be seen later, when syphilis is discovered at this early stage vigorous treatment is likely to annihilate the infection at once and abort the disease.

The Systemic Invasion of Syphilis

The chancre persists as an indolent nodule or excoriation or plaque—anything of this sort is called a lesion—for one to four weeks. During this time there is rapid multiplication of the organisms, as there always is in persistent infections. They first get into the lymphatics and soon after this into the blood stream. The first manifestations of this spread of the disease is the enlargement of the lymphatic nodes—so-called glands. One of the purposes of these lymphatic nodes is to act as filters and catch infections. They do this temporarily in the case of syphilis and in so doing become infected and enlarged. This enlargement of the glands first occurs in glands adjacent to the chancre, but later it occurs in other lymphatic glands all over the body. While the infection is spreading to the lymphatic nodes, the organisms likewise get into the blood streams and are carried over the entire body.

From 5 to 7 weeks after the appearance of the chancre, other manifestations occur that indicate that the patient has a generalized infection. Certain tissues of the body are particularly susceptible to syphilitic infection. These especially are skin and mucous membranes, nerve tissues and bones. In these tissues, particularly the skin and mucous membranes, you usually see most evident the symptoms of syphilis. After the enlargement of the lymphatic glands the first development is the eruption. The patient may or may not also develop headache and bone pains.

Early Eruptions of Syphilis

The eruption of syphilis, while characteristic to the expert (and to the expert alone) manifests a great number of variations. As a rule it is a very trivial, not very abundant eruption of light pink spots over the body. Sometimes it occurs in little lumps, sometimes in an eruption with pustules and sometimes with an eruption that ulcerates. But one rarely sees any primary eruption of syphilis that goes beyond trivial looking pinkish spots, somewhat like a sparse eruption of German measles. The severe eruptions of syphilis are seen with great rarity in private practice. They are usually reserved for the neglected, the dissipated or those who otherwise are utterly neglectful of their physical condition. These secondary eruptions of syphilis, if left to themselves, may become worse, or they may fade. They show a tendency to recur after disappearance.

The same eruptions that occur on the skin

occur on the mucous membranes, particularly of the mouth and genitals, and they run a similar indolent and recurrent course. It is these lesions that occur on the mucous membranes, particularly about the mouth and the genitals that are so dangerous to others, and for this reason: The skin lesions, so long as the surface is unbroken, are not contagious. The organisms are under the horny layer of the skin; it walls them off from the surface and contact with the surface therefore does not transfer the organisms to others. On the mucous membrane, however, where the horny layer is much thinner and quickly becomes mascerated from moisture, the lesions become open lesions—that is the horny epidermis is thrown off and spirochetes swarm upon the surface. If it were not for these lesions on the mucous membranes very little syphilis would be transmitted to others, and the disease would soon disappear.

General Symptoms of Early Syphilis

Along with the evidence of systemic infection, as shown by the eruption, the indolent, slight enlargement of glands and things of that sort, there is usually a little disturbance of health; the patient may be more or less run down in health, may sleep poorly, have headache at night, and perhaps slight fever—symptoms common to general infections. The effect upon the general health usually is, in the early stages of the disease, very slight. Occasionally patients lose flesh and are manifestly ill. Fever may be entirely absent. As a rule it does not amount

to more than a degree or two and only very rarely is it a distinct fever of two or three degrees. As has been said, after a few months all of these manifestations of a general infection as a rule subside. Occasionally they flare up again, but as a rule they are gone and the patient is apparently well. It is not common, I think, that in untreated cases of this sort, the patient is actually completely free from his infection, but it is undoubtedly true that in an enormous number of cases nothing ever occurs again to make the patient realize, as far as his physical condition is concerned, that he has syphilis.

But the weak point about this apparently happy ending is that we cannot be sure that this is so and that the patient has heard the last of the disease; for in a certain proportion of cases there are left foci of infection which are probably walled off, in most cases by inflammation which produces fibrous capsules around them. Sometimes these foci, from one cause or another, become active. The balance, perhaps, between the patient's resistance and the virulence of the organism, is overcome in favor of the spirochetes; they begin to proliferate actively and they produce active lesions of syphilis.

Late Lesions of Syphilis

The late lesions of syphilis are all represented by these isolated foci of the disease. The course of the disease is this: Under the stimulation of the infection the body develops enough resistance to destroy the spirochetes that are in

the circulation and most of those in the tissues. Only such foci are left as are favorably situated to resist the body's attack. The late manifestations of syphilis, therefore, are all manifestations of local syphilis in one tissue or another.

The late lesions of syphilis may occur anywhere in the body. They may occur in any of the internal organs; and when they so occur, they produce symptoms that are referable to disturbance of function of the particular structure involved. The lesions in the various organs may produce disturbances that have characteristics of syphilis that suggest the disease to the trained observer; on the other hand it may occur that these obscure lesions of syphilis may produce no characteristic symptoms. It is for this reason that the patient who has had syphilis should always tell his physician of that fact in the event of illness. This fact may throw a flood of light upon an obscure situation—often a situation obscured by a negative Wassermann—and the patient owes it to his physician and to his own safety to inform him upon this point.

While the late manifestations of syphilis may occur in any part of the body, they show a great predilection for the same tissues that syphilis shows a predilection for in its early course; you see, therefore, manifestations of old syphilis chiefly in the nervous system, in the bones, in the skin. You also see it in the other tissues in which in early syphilis there are no symptoms indicative of its susceptibility but which microscopically is shown to be early

invaded in syphilis, and that is the walls of the blood vessels. Indeed, syphilis would hardly be a serious disease but for the fact of its predilection for the tissues of the nervous system and of the blood vessels. It is its involvement of these tissues in old syphilis that makes the disease a serious one. And it is serious in these tissues, not because the disease runs a rapid course in them, but because it runs a course that gradually damages them, and these structures are so vital that the interference with function produced by this chronic process may be of grave importance. Fortunately these manifestations in the blood vessels and nervous system are relatively infrequent. Compared in fact with the vast amount of syphilis the proportion of cases which get these serious involvements is extremely small.

CHAPTER III

HEREDITARY SYPHILIS

Hereditary syphilis is syphilis transmitted to the child before birth. Syphilis is not the only disease that can be transmitted in this way. All of the eruptive fevers, for example, such as measles, scarlet fever and smallpox may be acquired by the child before birth if the mother has the disease. But these are acute diseases whose course is quickly run. The unfortunate difference with syphilis is that syphilis acquired before birth is a persistent disease.

Syphilis may be acquired by infection at the time of birth. Then it runs the usual course of syphilis, with the chancre and the ordinary evolution of the disease. This is a different picture from hereditary syphilis or syphilis acquired before birth. In hereditary syphilis the infection is acquired by the child through the blood which it gets from the mother and it develops probably as a generalized infection from the start. It thus presents a somewhat different clinical picture from acquired syphilis, but this is due to the severity of its manifestations, as a rule, and not to any essential difference in the character of the lesions. The lesions of hereditary syphilis and of acquired syphilis are essentially the same.

Like acquired syphilis, hereditary syphilis varies much in its severity. Doubtless difference in degree of resistance of the tissues plays

a part, but probably the greatest influence in determining the severity of hereditary syphilis is the age of the fetus when the infection is acquired. The earlier in its life that the fetus acquires the infection, the longer is it inevitably exposed to the damaging conditions and the severer, as a rule, are the manifestations of the disease. If the infection occurs in the third or fourth month, the fetus is likely to die and abortion take place. This makes syphilis one of the commonest causes of abortion. If the mother contracts syphilis after the fetus reaches the age of seven months, it is very likely to escape hereditary syphilis.

In early infections, if the fetus is not destroyed, the child is likely to be born with severe active manifestations of syphilis and when this occurs the disease is very apt to result fatally. This prospect is greatly reduced by efficient treatment. Much more frequently the child may be born apparently healthy, although actually infected.

In these cases the disease makes itself manifest, as a rule, in three or four weeks after birth. Rarely does it do so later than six months. In statistics which have been made from extensive series of cases it is shown that the disease appears in fifty per cent of apparently healthy syphilitic children before the second month, in seventy-five per cent before the third month, in ninety per cent before the fourth month and in ninety-five to ninety-eight per cent before the seventh month. There is, however, an occasional appearance of hereditary syphilis with milder manifestations as late as several years after birth, and there is a tend-

ency among some syphilographers to insist that hereditary syphilis may remain concealed and appear as late even as the twentieth year. I am firmly of the opinion that this is not a fact. The syphilitic child shows its manifestations early, and this is fortunate from the standpoint of syphilis, for then prompt care can be given to these cases.

Syphilitic children which are born apparently healthy show no evidences of anything abnormal; they are normal children and only as their syphilis subsequently causes damage to tissues are they physically and mentally damaged. Some children, who survive early congenital syphilis, may show very little trace of the disease. Usually, however, they are physically below normal and if uncared for present characteristic defects. Damage to the nervous system may be produced as in acquired syphilis, but their mental development is not below normal. If hereditary syphilitic children are carried successfully through the early attack of the infection by treatment, they show in fact a more definite tendency to spontaneous recovery than do those with acquired syphilis. These are two large facts which are strong evidence to this effect. The first is that patients who have had hereditary syphilis occasionally contract the infection again in the ordinary way—the best possible evidence that they have recovered. The second is that hereditary syphilitics practically never transmit the disease to their children.

There is a common impression that the children of syphilitic parents, even if they escape the disease, are apt to be physically or mentally

unfit and likely to show anomalies or defects of development. As a matter of fact, they show no such tendencies. Long experience has shown that the children of syphilitic parents, if they escape the disease, escape it entirely. They inherit the normal characteristics of their parents and they show no especial unfitness for life.

Prevalence of Hereditary Syphilis

It is impossible to arrive at any definite estimate of the prevalence of hereditary syphilis. The disease when untreated is so fatal that most cases disappear. Among children more than two years old the number of cases of hereditary syphilis is exceedingly small. In one group of cases in a children's clinic there were 720 cases of hereditary syphilis among 106,000 child patients; that is of this group of children who were sick from something, and of the public clinic class, only two-thirds of one per cent showed hereditary syphilis.

Transmission of Hereditary Syphilis

For manifest reasons it has been accepted that syphilis might be transmitted to the third generation and possibly further; and from the earliest days of syphilis this question has been one of constant interest and observation. The transmission to the third generation is a theoretical possibility. Equally possible is it that if syphilis could be transmitted to the third generation, it could be transmitted to the fourth and so on. As a matter of fact, however, transmission to the third generation is still an undetermined possibility. There are described from time to time cases which seem to indi-

cate the likelihood of syphilis having been transmitted to the third generation. These cases, however, are so exceedingly rare that they are medical curiosities and hardly one can be cited in which the evidence is conclusive. On the other hand, authorities with enormous experience in syphilis, who expected to find that such transmission at times did occur, have been in the end compelled to abandon the opinion. In view of all of the facts it must be said that, if it ever occurs, it is with such unexampled rarity as to make it entirely negligible.

Marriage of Hereditary Syphilitics

The failure of hereditary syphilis to be transmitted to the third and fourth generation indicates that having had hereditary syphilis is not in itself a bar to marriage. Patients who have distinct evidence of having had hereditary syphilis often belong to the class of the physically and mentally unfit—quite apart from their having had syphilis—and as such, from the standpoint of society, are not suitable persons to bear children; but this is on account of their general defectiveness and not because they are likely to transmit syphilis.

CHAPTER IV

THE TREATMENT OF SYPHILIS

The treatment of the ordinary manifestations of syphilis has long been one of the most satisfactory and definite things in medicine. Until the last fifty years, since our knowledge of disease has so enormously increased, we have had few specific remedies—that is remedies which were useful because of their direct effect upon the particular disease for which they were given. We have not many such remedies now. Diphtheria antitoxin, which is a specific neutralizer for the poison of diphtheria and for nothing else, is the most useful example of this that we have today. Equally specific, and miraculous in its effect, is the use of thyroid substance in those unusual but very striking diseases in which there is great lack of thyroid secretion. But one cannot furnish many illustrations of these specific drugs for specific diseases even now. And until recent years there were only two valuable specific remedies. These were quinine for malaria and mercury—and possibly there should be included the iodides—for syphilis.

Mercury and the Iodides

Mercury has been one of the favorite remedies of all times for skin diseases on account, we know now, of its antiseptic effect. Our knowledge of its use in syphilis is as old as

our knowledge itself. Mercury is a powerful remedy which can produce serious effects and its abuse through over-use in the history of syphilis was great, but always it has been recognized as the one reliable remedy for controlling that disease. As a matter of fact mercury for syphilis is one of nature's best gifts to man. Properly used—and its proper use is not difficult—it has always been our greatest reliance in syphilis and, in my opinion, remains so today. We have long had another valuable remedy in syphilis. This is the iodides, which were introduced by Wallace of Dublin in 1834. The introduction of the iodides in the treatment of syphilis in 1834 was, after mercury, the only addition of any remedy of specific value, from the time of our first knowledge of the disease until 1909. All experience has shown the great value of the iodides in influencing the disappearance of syphilitic lesions. But experience does not show that the iodides have any effect in eradicating the disease. In this respect it differs from mercury, which has a very great effect in curing syphilis. How mercury acts in curing syphilis is not a settled question. It probably acts, partly directly as a poison in destroying the syphilitic organisms but it also acts directly in stimulating the natural resistance of the patients so that they are better able to themselves combat the disease. This latter is a very valuable quality of mercury in the treatment of syphilis. It not only directly acts to destroy disease but, contrary to a vulgar impression, it helps the well-being of the patient and puts him in better condition to combat the disease himself.

Arsphenamine in Syphilis

The other great remedy in the treatment of syphilis is arsphenamine, introduced by Erlich in 1909, under the names of Salvarsan or 606. Arsphenamine was introduced as a cure for syphilis. It was inevitable that a remedy with such possibilities should obtain at once the greatest notoriety. That is always unfortunate, because preliminary expectations are nearly always not fulfilled. This was the case with arsphenamine. It has not proved a reliable cure for syphilis. This fact is not generally known and we are, therefore, in the situation that is always dangerous of relying too confidently upon an unsafe resource. A few physicians and a great many patients are of the belief that a round of treatment with arsphenamine means the cure of syphilis. The result is that many patients after inadequate treatment with arsphenamine neglect their syphilis under the dangerous impression that it is gone. Experience, on the contrary, has shown that treatment with arsphenamine has to be supplemented by treatment with mercury and that the cases require the same persistent attention to treatment that we found necessary in the past.

Arsphenamine is a specific remedy in syphilis and one of very high effectiveness. It causes the disappearance of syphilitic manifestations with great rapidity. It has one usefulness whose value cannot be exaggerated, and that is that when syphilis is gotten very early in its course—that is, within two weeks of the time of the appearance of the chancre—it can

be eradicated by treatment with arsphenamine; often by one course of treatment.

But the prospect of thus curing syphilis with arsphenamine rapidly diminishes and by the time syphilis usually appears for treatment—when its general manifestations have become evident—this fortunate prospect is past and the cases must be treated with the persistence and thoroughness that were found necessary in the pre-arsphenamine days. General knowledge of these two facts are of the highest practical importance. Nothing is more important to the person who has contracted syphilis than for him to go for treatment as soon as possible after he discovers that he has a chance. He has a prospect then of aborting the disease and getting rid of it at once with arsphenamine. It is of almost equal importance that the minds of syphilitics should be disabused of the idea that in the ordinary case a few doses of arsphenamine is all that is needed in the way of treatment. In all cases except these fortunate, rare cases of syphilis which are recognized in the first two weeks of the chancre, it is necessary to give syphilis the prolonged careful treatment that it has had in the past. Arsphenamine is no more a quick cure for syphilis than is mercury. Arsphenamine is in fact a two-edged sword. It does not build up the resistance of syphiltic patients as does mercury. It seems, indeed, to interfere with the natural building up of this resistance. Its administration, therefore, is a matter to be carried out intelligently by the physician and is, indeed, dangerous to the course of syphilis if used in a haphazard manner.

Present Day Treatment of Syphilis

The present day treatment of syphilis is generally accepted among authorities as a combined treatment of arsphenamine and mercury. Some men, whose opinion is entitled to weight, rely upon mercury alone as a curative agent, and if they use arsphenamine, confine its use to the early abortive treatment, or use it as a symptomic remedy. Always, except in the early abortive cases, the treatment must be continued for as long a time as heretofore. The patient who has had syphilis should stay under the observation of his physician for three years at least, during the first year of which he has treatment for about half of his time, the second year about one-fourth of his time and the third year about one-sixth of his time. These are, of course, rough estimates. In treating syphilis, as in treating other diseases, you are treating a patient as well as a disease and no hard and fast routine is desirable with all patients.

The greatest trouble about the treatment of syphilis is that it is tedious. In the treatment of any case of syphilis, therefore, it is particularly desirable that there should be close cooperation of the patient with the physician in carrying out the treatment. It is usually not very troublesome and the patient is usually not suffering from his disease. After the first few weeks he does not know from his physical condition that he is infected. He is, therefore, apt to neglect, not only treatment, but the care of himself that is necessary. But one of the im-

portant things in the treatment of syphilis is general care on the part of the patient himself in order that he may maintain at the fullest his physical vigor and his natural resistance to the infection.

General Management of Syphilis

All clinical experience supports the fact that the natural defenses of the body furnish a powerful means in most cases for combating syphilis. Other things being equal, the ideal patient to resist syphilis is the individual of sound body and of good physical inheritance, who lives a rational life under proper hygienic conditions. But resistance to syphilis varies among normal men. Occasionally an apparently vigorous normal individual shows undue susceptibility to the syphilitic infection, but this is exceedingly rare; and, as a rule, with very few exceptions, the healthy individual shows least the effects of syphilis. In the management of syphilis a rational mode of living is of high importance. The man of sense, who leads a reasonable life, free from excesses, who has the will to carry through his course of treatment, is the one for whom the troubles and dangers of syphilis are likely to be least. On the course of syphilis, perhaps, as much as on that of any other disease, are shown the unfavorable effects of bad modes and conditions of living. To offer an extreme illustration: the patients in whom we see the most serious manifestations of secondary syphilis—and nearly all of the most serious manifestations of tertiary spyhilis except tabes and paresis—are dissipated vagabonds, in whom exposure, poor food

and dissipation have reduced resistance to its lowest degree. Coming higher in the social scale, another illustration of the unfavorable subject of syphilis are the reckless men-about-town, without domestic obligations or without sense of responsibility for them, who burn the candle at both ends and who have not the intelligence nor the will to follow reasonable instructions about the conduct of their lives or of their treatment; in subjects of this kind syphilis is apt to prove a very serious thing. It is well for the syphilitic, while he is in the early years of treatment and, perhaps, throughout life, to give a little more than ordinary heed to avoiding excesses, even those that are innocent. The effects of overwork, of anxiety and worry and of undue mental and physical efforts of all sorts are presumably unfavorable. The patient should avoid these excesses as far as possible during the period of treatment. He should husband his resistance.

The chief reasons for believing that the innocent excesses of overwork, strain and things of that sort are important in the management of syphilis is that the two serious manifestations of syphilis in the nervous system—tabes and paresis are commoner under the intense conditions of urban life than they are under other conditions. Tabes—locomotor ataxia—and paresis have been unknown in primitive people, such as African negroes It is probable also that over-strain, particularly physical over-strain, predisposes to syphilis of the blood vessels, which is one of the serious late manifestations of the disease.

Alcohol and Tobacco in Syphilis

Among the other restraints which the syphilitic should put upon himself is that in the use of alcohol. The free use of it; even the moderate use of it—in the sense in which the habitual drinker uses that term—makes the management more difficult. The damage from the use of tobacco is very much less certain. It undoubtedly tends during the early part of syphilis to make more frequent mucous patches in the mouth, which are not particularly troublesome to the patients but are very dangerous to others, and it also tends to increase the possibility of late troubles in the mouth, which are one of the occasional penalties of syphilis. Further than this its harmfulness does not go.

CHAPTER V

DIAGNOSIS

It is manifest that it is very important to the patient that the question whether he has or has not syphilis should be accurately determined: that is, the diagnosis of syphilis is of very great importance to him. If he has it, it is of the utmost importance to his physical health that it shall be determined as soon as possible, but it is hard to say whether it involves more important consequences to fail to make a diagnosis in the presence of syphilis or to make a diagnosis of syphilis in its absence. And this latter mistake is one that is possible. The question of diagnosis in a suspected case of syphilis, therefore, is one which should be given serious and painstaking consideration. It is particularly important that great care should be used in making a diagnosis of syphilis from the early chancre, when the only thing upon which the diagnosis can positively be made is the recognition of the spirochaeta pallida. This can be definitely done, but it is a matter that requires experience in the recognition of this organism and should not be relied upon except where the observer feels that from his experience he is competent to say positively that the organism is the spirochaeta pallida. I think it is better—certainly it is better if there can be any uncertainty about the organism—when the diagnosis is made from the spirochaeta pallida

alone, to have two different observers agree upon the diagnosis. The making of the diagnosis of syphilis from the recognition of the spirochaeta pallida in the chancre is a matter of so much importance, because this must be made, in the most favorable cases, upon this fact alone—that is, before the Wassermann be comes positive and before there are any other unquestionable evidences of syphilis. If there is any uncertainty about the diagnosis from the spirochaeta pallida, the matter is of so much importance that it would be better to wait until a positive Wassermann is obtained, before definitely deciding that the case is one of syphilis.

If the Wasserman is already positive at the time that the patient presents himself for diagnosis, the combination of spirochaeta pallida and a positive Wassermann, gives a situation where a mistake is much less likely to occur.

When cases present themselves for diagnosis after the disease has become generalized, when there is likely to be some eruption, when there is characteristic but slight enlargement of glands in various locations of the body, perhaps mucous patches in the mouth, and especially when there is a history of an indolent excoriation or superficial ulcer which has lasted for several weeks and with the healing of which the other symptoms have appeared, the diagnosis can be made on the symptoms alone without any laboratory tests. As a matter of fact before the days of the recognition of the spirochaeta pallida and before the Wassermann, the diagnosis was made, and was conclusively made, on this very definite evolution of the

symptoms. It was generally recognized then that a diagnosis of syphilis was not to be made upon the chancre, no matter how characteristic, but only after a long enough time had elapsed for the disease to manifest its characteristic preliminary course.

By the time the disease has existed for a few weeks, the Wassermann reaction has become positive. It is positive several weeks before the appearance of these systemic symptoms and is positive when they appear. In the presence of syphilis which has gone far enough to undergo its characteristic evolution, we have a situation in which the diagnosis can be made with unquestionable accuracy. But when it is made we must be sure of all of our facts. At this time in the course of syphilis the demonstration of spirochetes is not usually an important matter, although in open lesions, as those in the mouth, they can be easily demonstrated. A great deal of dependence at this stage is apt to be put upon the Wassermann reaction, and here is where there is an opening for error. In early systemic syphilis reliance for diagnosis should not be made upon the Wassermann reaction unless there is no possibility of doubt as to its accuracy. At this time there are other facts, other signs, or symptoms of syphilis which should be present in a case of active syphilis. If these are absent, quite as much care should be exercised in the acceptance of the Wassermann as in the acceptance of the presence of the spirochaeta pallida in the stage of the chancre. When syphilis has become systemic the Wassermann is strongly positive.

For the purpose of using the Wassermann as

an index of treatment there is a tendency now to make it as sensitive as possible and the result is there is a possibility at times of a false positive Wassermann. The Wassermann is usually read as one plus, two plus, three plus and four plus; the one plus being the slightest positive reaction and the four plus the strongest positive reaction. The one and two plus Wassermann ought not to be accepted as conclusive evidence of the presence of syphilis; it should be strongly positive, that is three or four plus. Cases are likely to arise where the question of the Wassermann in diagnosis of early syphilis is of extreme importance. There are many eruptions which are nearly like those of syphilis. A patient develops such an eruption; the question of syphilis properly comes up; a Wassermann is made and you get back a doubtful positive. This sort of a situation is one where the very serious mistake of making a false diagnosis of syphilis is likely to occur if the greatest care is not taken. In such a case all of the facts should be carefully reviewed and the positive diagnosis of syphilis should not be made either until there can be no question from the symptoms of the patient that it is syphilis or until the Wasserman has been repeated sufficiently often to leave no doubt that it is a certain, positive reaction.

This question of the reliability of the Wassermann test is one of very great practical importance. Like all other laboratory tests we are apt to attribute to it an infallibility which, of course, it is not entitled to. Carefully made and intelligently interpreted, where the reaction is frankly positive or frankly negative,

it is a reliable test. Sometimes it is not carefully made. This, I think, is rare. Much more frequently the effort is made to give it a refinement of accuracy which is not safe. One is on safe ground if he takes this attitude with the Wassermann: If the reaction is skilfully done and is without any question and to a high degree positive, it means syphilis; if the reaction is not positive to a high degree, if it is one which suggests syphilis but is not sufficiently marked to be what is called a frank positive Wassermann, it is not safe to make a diagnosis of syphilis on that fact alone in a new case. It should either be absolutely positive or it should be supported by other evidence of syphilis. In general the amount of weight to be given to the Wassermann is that of one symptom of syphilis. It is one symptom which may be beyond question, but it is a symptom, when not perfectly characteristic, which is not entitled to more weight than other symptoms and signs when they are not perfectly characteristic.

Diagnosis of Late Syphilis

When it comes to the diagnosis of late syphilis our dependence is likewise not only upon the Wassermann but upon other evidence of the disease. In some cases of syphilis of the internal organs the diagnosis must at times be made upon the Wassermann alone. Even without any history of the disease, in most cases of late syphilis there is other evidence of syphilis and it is very important to elicit this in making a diagnosis. When the lesions of late syphilis occur on the skin, they are us-

ually characteristic and allow a diagnosis to be made by the practiced eye with more certainty than can be made with the Wassermann. In late syphilis, indeed, the diagnosis must often be made upon the clinical characteristics of the disease without the presence of a positive Wassermann, for it is not very rare to see unquestionable late syphilis, whose character is proven by its rapid disappearance under syphilitic treatment, in which an unquestionable positive Wassermann cannot be elicited. Sometimes, indeed, in these cases it is frankly negative.

The Wassermann, then, is not a safe short cut of infallibility in the diagnosis of syphilis. It is a very valuable test, but it is a test which is open to error and upon which too much reliance is apt to be placed unless it is interpreted carefully and intelligently.

CHAPTER VI

PROGNOSIS OF SYPHILIS

What is the physical future of the man who has contracted syphilis? Suppose he has intelligent treatment, that he consistently carries out and lives up to good advice, what has he to expect? The prognosis of syphilis, that is the prospect as to its future course, is good as respects the outcome of most well treated cases. In view of the fact of the common dread of syphilis this broad fact should be emphasized. Most cases of syphilis under proper conditions pursue a favorable course, disappear and leave the patient free in after life from any evidence of the disease. This is so contrary to common impressions that I think it well to fortify it by quoting Osler, who, until his recent death, was the foremost English speaking clinician. He says, writing with Churchman on the subject, in 1914:

"Syphilis is a curable disease. It is not, however, *always* cured even by the most efficient treatment; and there is unfortunately no way of determining with exactness whether treatment in a given case has been sufficient to warrant us in a dogmatically favorable prognosis. We have only empirical results to go upon; but the clinical records of large series of cases carefully studied over long periods of years, justify the following conclusions as to the outlook for a luetic patient: (1) In general, the prognosis for the average case is good with careful treatment, and bad without it. . . ."

As a matter of fact an enormous number of untreated cases of syphilis—cases altogether

uncared for—pursue a benign course. I have seen in a great number of cases patients who unquestionably had syphilis, who had no treatment, or practically no treatment, and yet who never suffered any late (or early) manifest ill effects of the disease. As Osler says, however, the prognosis is vastly improved where the patients have thorough and intelligent treatment and management.

The weak point in the prognosis of syphilis is that we cannot be sure that the patient is cured. We can tell him that we believe he is cured, that his prospect of late accidents of syphilis is probably far less than his prospects of being injured by an automobile, for example. But we cannot tell him absolutely that he is well and that we know he will never have any further manifestations of syphilis. That is what everybody would like to have, but when you come to think of it, that is a pretty hard thing to say in any situation. It is a fact that a percentage of the cases of syphilis, relatively small though it be, have serious after consequences of the disease, and we have no way by which we can give absolute assurance in any given case that these consequences will be escaped. The most we can do is to assure the patient that by pursuing a given course, the possibilities of these consequences will be reduced to a minimum. These assurances we are, with our present knowledge of syphilis, abundantly justified in giving. Further, most of the late manifestations of syphilis, even when they occur, are easily amenable to treatment once they are recognized. Their treatment indeed is

one of the most definite things in therapeutics. There is, however, an exception to this and that is syphilis of the blood vessels and certain forms of syphilis of the nervous system.

Syphilis of the blood vessels, like other syphilis, is amenable to treatment when recognized. The trouble about it is that it may escape recognition until it has done damage to the blood vessels, and the large blood vessels are structures exposed to such constant, hard use that this damage to them, even if the process is stopped, interferes with their function and seriously injures the individual's physical vigor and life expectancy. This is one of the reasons why the person who has had syphilis should have a physical examination at least once a year, in order to detect incipient manifestations of syphilis before it has caused serious damage.

The other, and the most serious late effects of syphilis, are tabes and paresis. These are the same processes occurring in different parts of the nervous system and it is they which cause the great dread of syphilis. There is much difference of opinion as to how frequently they occur. Their manifestations are so striking that every case that occurs is likely to be counted over and over again, and everyone knows some cases of these conditions. As far as my experience goes over 30 years in which I have kept track of syphilitic patients, these manifestations of syphilis are extremely rare. Even when tabes and paresis develop, the condition is sometimes spontaneously arrested and in incipient cases now—and incipient cases can

easily be recognized—the prospect of arresting the condition and avoiding its late manifestations by treatment have been very much improved.

As a matter of fact, looking at the subject broadly, syphilis would be an enormously less serious disease than tuberculosis were it not for its possibilities of involving the nervous system and for its social complications. But even including these, I believe it is one which is much less serious than tuberculosis. The treated case of syphilis is not sick or confined to his house, he does not have to give up his work and devote his time so painfully to getting well. And the prospect of its killing him, of greatly shortening his life or of making him a permanent invalid is vastly less.

I do not mean by all this to minimize the seriousness of syphilis. It is a disease sufficiently serious always to be eminently worthy of the most painstaking care on the part of the patient in carrying out treatment and in getting intelligent treatment. But if he does this, there is no more justification in living in constant dread of the late manifestations of syphilis than there is of living in dread of the ever present chance of violent death.

The Mental Attitude Towards the Disease

It is of very great importance that the patient who has had syphilis should get the proper mental attitude towards the situation. The dangers and the accidents of syphilis are constantly being emphasized, in order to impress upon people with syphilis the importance

of having their disease treated, because of the social aspects of the disease, and because of the tendency to emphasize everything that has to do with sexual irregularities, as syphilis usually does. For this reason there is a very prevalent syphilophobia. In many patients who have had syphilis this is the one great suffering that the disease produces. In some cases it is fully as bad as any possible actual manifestations of syphilis. There is no good reason for this. The prospects of the syphilitic are well within the prospects of serious misfortune that all of us face in going through life, and that most reasonable persons face with equanimity. There is a certain class of reckless and unintelligent who regard syphilis lightly. They make a great mistake. But there is even a larger class who allow it to excite in them undue and unreasonable apprehension. The person with syphilis should regard it as a matter in which he should have intelligent advice. He should follow this advice carefully. In the conduct of his life he should perhaps be more careful than he would otherwise be in living up to reasonable standards of proper living. These things done, he should not make it a source of constant worry and anxiety to himself.

Social Complications of Syphilis

There is one aspect of syphilis—its social and sexual complications—which, during the time of the active period of the disease, is very troublesome. Syphilis is contracted in 95 per cent or more of cases by sexual intercourse or kissing. The other 4 or 5 per cent come from indirect transference. This means that during

the active period of syphilis—and that cannot be put in any case below a year—intercourse and kissing and other intimate contacts must be avoided. It is morally a criminal offense for a patient with active syphilis to expose another to his disease by intercourse or other contacts that are dangerous of transmitting the disease. Under old conditions of treatment the period of this danger was at least of a year's duration. Under present conditions of treatment the time is perhaps shortened in many cases, but in determining this great skill and caution is necessary.

Syphilis and Marriage

The importance of this matter comes into consideration especially as respects marriage. It is important here from two standpoints. First, the syphilitic has no right to expose his partner to the disease and, second, none to expose his potential children to it. The question then becomes very important: When is it safe, if ever, for the syphilitic to marry? The answer to this question depends upon the answer to the question, how long is syphilis contagious?

I think there is no doubt that syphilis is only transmitted to the unborn child by infection through the mother. It has long been known that the mother of a syphilitic child could not contract syphilis. There seems every reason in the world to believe that the explanation for this is that she cannot contract syphilis because she has already had it. The question then reduces itself, as far as men are concerned, to how long must the man who has had

syphilis wait before he is safe from the danger of infecting his wife. Before the recent advance in our knowledge of syphilis, practical rules for the marriage of syphilitics had been found, as the result of long experience, whose working had thoroughly justified their adoption. These rules all recognize the importance of persistent treatment, but they were based upon the fact that the most important factor in diminishing the ineffectivity of syphilis is time, and that a period of three to five years, in well treated cases, practically eliminates the dangers of transmitting the disease. This fact is well illustrated by the records of Keyes, covering a large number of syphilitic patients and extending over many years. These showed the following facts:

During the first year of his disease the chances that the syphilitic husband will infect his wife are 12 to 1.

During the second year 5 to 2.
During the third 1 to 4.
After the fourth year all but nothing.

Infections were recorded in two cases in the fifth year, but none of Keyes cases of late infection was found among patients who had been well treated.

These statistics—and they agree with the conclusions of many other experienced and wise syphilographers of the last generation—practically mean this: That the danger of transmitting syphilis is very great during the first two years and that the risk should not be run. After the fifth year the syphilitic man who has been well treated is not properly debarred from

marriage by reason of the risk of transmitting it to his wife or his children.

In the last fifteen years, since the introduction of the new teatment of syphilis, we have undertaken to formulate new rules for the marriage of syphilitics and to reduce the time, but we are not in a position to justify this reduction. The conservative and the only safe rules that we have now are those old ones which long experience has justified.

These rules were established long before the days of the Wassermann and they, therefore, of necessity, take no account of that. It is undoubtedly true that a great many of these patients who it was found could safely marry had a positive Wassermann. In other words, these rules take no account of the Wassermann. And that is proper, for patients with old syphilis are not contagious although their Wassermann may be positive. In late syphilis, in deciding whether a patient is likely to transmit the disease there is no reason to take account of the Wassermann, because the Wassermann may still be positive and the patient be in no way dangerous to others. The criterion for safety in marriage, which demands that the Wassermann shall be negative, is not a proper criterion. In early syphilis the patient should not be allowed to marry even if he has a negative Wassermann. In old syphilis a positive Wassermann is no proper debarment.

CHAPTER VII

THE ETIOLOGY OF SYPHILIS

Distribution of Syphilis

The geographical distribution of syphilis includes all inhabited parts of the Earth whose people have come in contact with the outside world. There are perhaps still some peoples whose isolation is so complete that they have never yet had contact, either direct or indirect, with the rest of the world, and among whom syphilis has not yet appeared. The susceptibility of all mankind to syphilis is apparently about the same. As has been said, when syphilis has been introduced among a people who never before came in contact with the outside world and have not been affected by syphilis, it pursues a virulent course. But after a few generations this virulence settles down to the usual susceptibility of mankind in general. Syphilis is also no respecter of classes. Its prevalence and its ravages increase with the descent in the scale of civilization, its prevalence increasing because sexual habits become looser and its ravages increasing because of the lack of treatment and of other unfavorable conditions. Among civilized men its social distribution is dependent on the facts which influence sexual morality. Whatever makes for looseness in sexual relations increases the prevalence of syphilis. It is commonly assumed to be more prevalent in urban than in

rural populations. My own impression is that this difference is not great.

Prevalence in Women

It is considerably more common among men than among women. Various statistics would have it from two or three times to nine or ten times as common among men. The difference, in my experience, however, would hardly be more than two to one. The prevalence of syphilis among women appears to be less than it really is for the reason that it is often unsuspected. Its primary lesion may be concealed and remain undiscovered. It is often overlooked or given no attention, for syphilis runs a milder course in women than in men.

Frequency of Syphilis

The proportion of the population in civilized communities which has had syphilis can only be approximated. We have statistics of various military and civil groups, hospitals, penal and state institutions, from which a fair approximation can be made. Common estimates for this country run between 5 and 10 per cent. I believe the most useful statistics which we have would indicate that approximately 6 or 7 per cent of the adult population of the United States have, or have had, syphilis. European statistics run higher. They would indicate that syphilis is somewhat more frequent there than here, which I believe is in accordance with the fact.

Increase of Syphilis

Such facts as we have—and some of them are very suggestive—would indicate that syph-

ilis is not upon the increase. The most valuable statistics that I know upon the subject are those in the annual reports of the United States Marine Hospital Service since 1881. These statistics for 20 years indicate a very steady prevalence from year to year among the patients who present themselves for treatment for all conditions. The average of the whole period runs close to 8 per cent. These figures, covering more than a million cases of disease of all sorts and extending over a period of 30 years, are very valuable in this connection and indicate little variation in the prevalence of the disease.

It seems likely that syphilis is not on the increase. After becoming established among a people syphilis does not increase in geometrical ratio, each case infecting so many more individuals. Its prevalence is determined in large part by the sexual habits of man, and these vary very little. The permanent prevalence of syphilis, therefore, remains at a fairly definite standard, unless measures are taken to reduce its spread. In the present state of the world, with practically no effort made at the sanitary control of syphilis, its prevalence may be said to be its normal prevalence; that is its prevalence as controlled by the sexual habits of man. It is likely that syphilis is in general slightly on the decrease among the most intelligent people, as the result of attempts of recent years to give information to prevent its spread. Men are more alive to this subject than formerly and, as a result of this, there is probably an inappreciable decrease in the prevalence of syphilis.

Age of Contracting Syphilis

The age at which syphilis is most frequently contracted is an illustration of the fact that ignorance of its dangers or recklessness of them, is influential in causing it. It is most frequently contracted in men between the ages of 20 and 26, the maximum frequency being the 23rd year; in women between the ages of 18 and 21, the maximum being the 20th year. The hot spirit of youth is undoubtedly one of several other factors in this fact, but it can hardly be doubted that ignorance and recklessness of danger are the most common ones.

The Contagious Lesions of Syphilis

As has been pointed out elsewhere, the lesions of syphilis which are dangerous to others are the early moist lesions, that is the lesions of the first, and, sometimes, the second year. These early lesions are the contagious lesions because they are the ones which contain many spirochetes. When they are not moist they are not dangerous to others, because they are then covered by a horny layer of epidermis which prevents the escape of the spirochetes. Moist lesions mean that this protective layer is absent. This makes the dangerous lesions of syphilis to others the chancre and the lesions on the mucous membranes of the mouth and genitals. Both of these sorts of lesions are equally contagious. A great many more cases of syphilis are contracted from mucous patches than from chancres because the mucous patches are much more numerous and occur over a much longer period, their occurrence extend-

ing in untreated cases over months, while the chancre is nearly always a single lesion and its duration varies from 10 days to six weeks.

The late lesions of syphilis, that is the so-called tertiary lesions of syphilis are also potentially infections. But modern study of these lesions has shown that the spirachetes are so very few in number in these that contagion from them would be unlikely. Experimental study in animals also has shown that experimental syphilis occurs successfully under conditions so entirely different from the natural conditions of communicating the disease; such an excessive amount of the syphilitic material is required to produce infection that except under the artificial conditions of experiments the transmission of syphilis from tertiary lesions is almost, if not in fact, impossible. The infectious dangers of syphilis belong to the primary and secondary lesions of the disease. Greatest in the first months, these dangers gradually diminish during the first year and rapidly disappear during the second. As a practical fact the dangerous lesions of syphilis are largely confined to the mouth and genitals and the neighboring skin.

Transmission of syphilis by the body fluids, except in the case of its transmission by the blood stream in congenital syphilis, is practically not a danger of the disease. The blood is the means by which the spirochetes are transmitted to the unborn child in hereditary syphilis, but even during active syphilis, the spirochetes in the blood are so few, unless the blood is contaminated by flowing over an active syphilitic lesion in its escape from wounds,

that the blood is practically not dangerous in such contact with it as occurs in the experience of surgeons and nurses in operative manipulation of syphilitic patients. Syphilis is like other infectious diseases in that it requires the implantation of a large number of organisms for a successful infection to occur. The danger of infection increases up to a certain point with the quantity of the organisms implanted. Spirochetes in the blood—and this also applies to spirochetes in the tissues in tertiary lesions—are so few that, in order to produce infection, a relatively very large quantity of infected material is necessary. The practical lack of danger to others also holds true for the milk of syphilitics and also for semen and urine except where they pass over open lesions of syphilis.

To summarize, it may be said that direct infection with syphilis requires contact with relatively early open syphilitic lesions and that the practical dangers are attached chiefly to the lesions of the genitals and mouth, which are nearly always open moist lesions.

Indirect Transference of Syphilis

Syphilis can be transmitted by indirect transference of the spirochetes through some intermediate object which first comes in contact with an infectious syphilitic lesion and then with an abrasion in the skin or mucous membranes of an unaffected person. This indirect method of transference of syphilis was recognized early in the history of the disease. Only recently, however, have the conditions limiting it been determined. Our later experience has

shown that in every intermediate or indirect infection with syphilis, the time elapsing between the deposit of the spirochetes on the intermediate object and the infecting contact is limited to a few hours, approximately eight or ten. Experience has also shown that the contagiousness of syphilitic dead bodies is rapidly lost. Infections in making postmortems on syphilitics have been excessively rare and infections from syphilitic dead bodies, dead more than 24 hours, have not been known to occur.

Viability of the Spirochaeta Pallida

These facts indicate that the spirochaeta pallida is an exceedingly sensitive organism and not only fails to multiply but dies very quickly outside of its normal habitat, the human body. Experimental studies of the last few years have completely established these facts. The spirochaeta pallida in the highly artificial favorable conditions for living which can be produced in cultures can be propagated indefinitely. The discovery of how to do this by Nogouchi was a fine feat of skillful bacteriology. Through this alone were we able to make the final proof that this organism was the cause of syphilis. But, except under these highly artificial favorable conditions the spirochete dies in a very short time. It lives longest outside the body when kept moist at body temperature and not exposed to oxygen. Ordinarily the spirochetes die after removal from the body in six hours. They are also extremely sensitive to deleterious agents. Ordinary water quickly kills them; soap, fortu-

nately, is quickly destructive. They are almost instantly destroyed by the common antiseptics.

All this means practically that the danger of indirect transference of syphilis arises only when contact with contaminated objects takes place in a short time, at most six or eight hours after their contamination; and that vigorous scrubbing with soap and water or with antiseptics is effective in destroying them when they are outside of the body. It is fortunate for man that the viability and resistance of the spirochaeta pallida outside the living body are so slight. Indirect infection of syphilis is not now an uncommon occurrence. The organism of tuberculosis remains virulent for weeks under conditions that quickly destroy the spirochaeta pallida. If the spirochaeta pallida were equally resistant it staggers one to imagine what would be the ravages of syphilis.

Even as it is, various objects of common use, particularly toilet use, are occasionally sources of syphilitic infection. The most dangerous of these is the public drinking cup, placed where it is used by a large number of young adults. The transmission of syphilis by drinking cups is not an extremely rare accident. The transference by water closet seats is surprisingly rare. Any article which may come in contact with an active open syphilitic surface or be passed immediately from a syphilitic to another person may be a source of indirect transference of the disease. This applies to such articles as spoons, forks, tooth brushes, pipes and the instruments of physicians, dentists, nurses and barbers. But as a matter of fact it is very rare to be able to trace infections to such

methods of transference except among unusually dirty people. The barber shop would be expected to be a frequent means of transmission of syphilis. It is a frequent means of transferring ordinary pus infections. But—doubtless because of the destructive effect of shaving soap upon the spirochaeta pallida—the barber shop is almost guiltless, as far as my experience or knowledge goes, of the indirect transmission of syphilis.

Extra-genital Chancre

When syphilis is transmitted by indirect infection the chancre usually comes in an extra-genital location. These extra-genital chancres are usually on the hands or face—most frequently on the lips. Most extra-genital chancres like genital chancres are caused by indirect infection, the most frequent illustration of this being chancre on the mouth or lip from kissing. Kissing on the part of a person with active syphilis is a very dangerous act. Shamberg has recorded the appalling fact of seven young girls who were infected by one young man at a party where a kissing game was played.

Extra-genital chancres constitute less than 10 per cent of all chancres, probably, in my opinion, less than 5 per cent. Among respectable people their occurrence is infrequent, except unfortunately among physicians from the syphilitic hazards of their occupation.

Syphilis and Prostitution

The great source of syphilis is prostitution, either open or clandestine. The women who accept promiscuous intercourse do not go far

before they are exposed to syphilis. From European statistics it is indicated that probably 85 per cent of confirmed prostitutes have syphilis and about 30 per cent of these have it in the active period of the disease. The most dangerous prostitute is the new prostitute, the one who has not long been in the trade and whose syphilis, therefore, is likely to be recent.

CHAPTER VIII

THE PREVENTION OF SYPHILIS

The necessary facts for the control of a disease are first to know the methods of its transmission and, second, to have practical measures for the control of these methods. In the case of yellow fever, for example, since we have learned that it is transmitted only through a certain species of mosquito the whole sanitary attack upon yellow fever is centered upon first interfering with this mosquito coming in contact with patients sick with yellow fever and, second, destroying this mosquito. It is highly desirable to know the active cause of the disease but if we know the means of its transmission the knowledge of its cause is not essential. Medicine has long known the necessary conditions for the transmission of acquired syphilis. The problem of its transmission is exceedingly simple. The difficulty is that syphilis, although it is frequently innocently acquired, is for all practical purposes a sexual disease and is essentially bound up with the impelling force of the sexual appetite. If it were simply a sanitary problem syphilis could easily be exterminated from civilized communities.

The sanitary attack on syphilis can be made from two directions: That of limiting the contact of the infected with the healthy, and that of protecting the healthy from the dangers of infection when contact occurs. We cannot protect the healthy against the infection of syphilis by isolation or quarantine of syphili-

tics, as can be done with acute infectious diseases, such as scarlet fever, which run a short course. The period of infectiousness in syphilis is so much longer than in these acute infectious diseases and, most important of all, the number of syphilitics is so enormous that isolation or quarantine of them is impossible. Even personal indentification and supervision of them indiscriminately by health authorities has been a notorious failure. The reasons for secrecy are so strong, prejudices or feelings about sexual morality are so varied, and motives and sentiments so divided, that laws for reporting syphilis and the other venereal diseases are not sustained by public sentiment; and like all other laws, which sentiment is not behind, are ineffective. This, in my opinion, makes laws for the notification of syphilis—with identification of the patients—undesirable. The most that has proved effective in this way, and to my mind the most useful measure that has been enacted, is the West Australian act, which provides that the syphilitic patient must remain under treatment in the hands of a physician until the active contagious stage is passed. This physician is required to give notice of the existence of the case, but not to identify the patient. The patient may transfer himself from one physician to another. If so, the next physician must inform the one who has given the notification of the case that the patient is now under his treatment, and this same regulation applies to any further change of physicians. If the patient fails to stay under treatment, the physician who is responsible for the notification of the case and others who may

become engaged in it, are compelled to identify this patient to the health department and he then becomes subject to its regulations. This provides the most essential things: first, that the patient shall have treatment to render him as quickly as possible non-infectious and, second, that should he fail to avail himself of it the law will take him in hand.

One of the most important means we have of controlling syphilis is treatment to render them as quickly as possible non-contagious. Treatment has a very great effect to this end, and for the protection of others, as for the good of the patient himself, the patient with syphilis should be required to submit himself to necessary treatment.

Protection against the dangers of exposure to infection with syphilis takes various directions. The simplest of these constitutes avoidance of the common use of personal articles and of other articles which are likely to have been used by those with active syphilis. A great deal has been done in the last few years by educating the public to the dangers of the common use of personal articles in public places. Public drinking cups and public towels are sufficiently dangerous to warrant their prohibition, both on account of syphilis and other infectious diseases. I think this does not apply to soap which is destructive of the organism of syphilis and from whose surface organisms are constantly removed by solution, very much as from the surface of ice. One of the dangers of transmission of syphilis which is likely to be overlooked is that which comes from the manipulation of the body in taking care of

its physical needs. The barber, the manicure, the masseur, the chiropodist, the turkish bath rubber, the waiter and cook and others who handle food, the doctor, the dentist and the nurse may be the means of conveying syphilis, and the careless and dirty individual in any of these occupations should be avoided.

Personal Prophylaxis of Syphilis

But the real problem in the prevention of syphilis is that of protecting against the dangers from sexual contact with syphilitic persons. From 90 to 95 per cent of syphilis arises from sexual contact. Were it not for this method of origin syphilis would soon cease to exist. There is one method of personal prophylaxis of syphilis after exposure: This is the thorough washing with soap and water and then the careful anointing of the entire exposed area with a 33 per cent calomel ointment. For this to be effective it must be done within eight hours after exposure and the sooner it is done after exposure the less the risk.

Under conditions of military discipline, where such a measure can be systematically and thoroughly carried out, it has proved its effectiveness. It is not a sure preventive of infection but it very greatly reduces the dangers of it. It has not proved nearly so effective outside of military surroundings, because of the difficulty of getting it carried out by the careless and unintelligent. There can be little doubt that this method of personal prophylaxis would be the most effective weapon that we have against syphilis were it generally known and commonly practiced.